Multivariable Analysis of Wasting Incidents in Children Under the Age of 5 in Kupang Regency East Nusa Tenggara

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Abstract

Wasting is the condition of a child whose weight decreases over time until the total body weight is far below the standard growth curve or weight for height is low (thin) and shows weight loss (acute) and is severe. East Nusa Tenggara, the frequency of acute and chronic nutrition ranks highest in Indonesia with the prevalence of wasting still above the national average. The prevalence of wasting in NTT will increase from 7.5% in 2021 to 8.0% in 2022. Kupang Regency is one of the districts in NTT that experienced the highest increase in the percentage of wasting under five, namely 11 % and in absolute terms under five with wasting nutrition problems 42 under five in Year 2021 (NTT Provincial Health Office, 2021). This research is an observational analytic study. The approach is carried out by case control and using a multivariable model which is one of the analytical techniques to determine the relationship between various variables in health. The research will be carried out using simple random sampling. Kupang Regency is one of the districts in NTT that experienced the highest increase in the percentage of wasting under five, namely 11 % and in absolute terms under five with wasting nutrition problems 42 under five in Year 2021 (NTT Provincial Health Office, 2021). The results of this study indicate that the factors causing wasting are exclusive breastfeeding (41.9%), Basic Sanitation (56.3%), Parenting (88.2%), and Parents Income (42.9%). The results of this study indicate that the causes of wasting based on these variables have a significant difference (p <0.05). Recommendations from this study are expected for policy makers both in health services to carry out socialization and counseling about exclusive breastfeeding, parenting, sanitation and parents income.

Keyword: ***Basic sanitation, Exclusive breastfeeding, Parenting, Parents income, Wasting***

INTRODUCTION

Wasting is the condition of a child whose weight decreases over time until the total body weight is far below the standard growth curve or weight for height is low (thin) and shows weight loss (acute) and is severe. The trigger for wasting is usually because the child has diarrhea so that his weight has dropped dramatically but his height is not a problem (Kemenkes RI, 2020).

Nutrition as one of the factors that determine success in achieving optimal growth and development during infancy. The target for reducing wasting rates in the world is 7.8% with a 2025 achievement target of 5% which requires a reduction of 40% from now (WHO, 2016).

Based on the Sustainable Development Goals (SDGs), the target is expected to end all forms of malnutrition by 2030, reducing stunting and wasting in toddlers (Kemenkes RI, 2013).

Various problems that can arise from wasting and other malnutrition include reducing the possibility of survival, hindering optimal health, growth and development. Especially in brain development related to cognitive abilities so that it provides long-term effects that will affect the child's entire life. Lack of cognitive ability, easily disturbed health, decreased school performance and low income are some of the impacts that can occur, so that sooner or later it will affect the development of a nation (UNICEF, 2013).

East Nusa Tenggara, the frequency of acute and chronic nutrition ranks highest in Indonesia with the prevalence of wasting still above the national average. The prevalence of wasting in NTT will increase from 7.5% in 2020 to 8.0% in 2021. Kupang Regency is one of the districts in NTT that experienced the highest increase in the percentage of wasting under five, namely 11 % and in absolute terms under five with wasting nutrition problems 42 under five in Year 2021 (Kemenkes RI, 2020). The goal to be achieved in this study is to determine the determinants of wasting in toodlers in Kupang district.

Wasting has such a big impact that it is still said to be a public health problem. Children under five who are wastin can indirectly experience nutritional deficiencies which in turn can have an impact on growth health, infectious diseases and children's intelligence. Unresolved malnutrition in infancy can affect intellectual performance, work capacity, and health conditions at a later age (de Onis, 2016).

Based on a preliminary study conducted in August 2022, it was found that there was an increase in the incidence of wasting from 7.5 to 8.0% with the number of children experiencing wasting in Kupang currently reaching 3,239 people. With this number, Kupang is in 11th place with wasting in NTT (Kemenkes RI, 2020). Based on interviews with the head of the Health Service, it was said that the biggest contributor to the increase in wasting was the lack of exclusive breastfeeding because mothers were busy working, enviroment sanitation, parents income and poor parenting styles. This condition is thought to be a factor contributing to the incidence of wasting in Kupang district.

METHODS

This research is an observational analytic study. The approach is carried out by cross sectional and using a multilevel model which is one of the analytical techniques to determine the relationship between various variables in health. The research will be carried out using simple random sampling, namely a sample selection design that selects samples through dividing the population into strata and then samples are randomly selected in each stratum (Notoatmodjo, 2015). The method used at the first level is to randomly select 10 villages in the Kupang Regency area, at the second level to randomly select 25 posyandu. Five research subjects will be taken from each posyandu so that the sample studied is 100 research subjects. This study uses research instruments that have been tested for validity and reliability.

RESULTS

Table 1. Frequency Distribution of Research Subjects

Variable	Frequency	%
Wasting		
(Wasting)	65	65.5
(Not Wasting)	35	35.6
Exclusive breastfeeding		
Not Exclusive	74	77.3
Exclusive	27	26.7
Parenting		
< mean (Less)	73	72.3
≥ mean (Good)	28	27.7
Environment sanitation		
< mean (Less)	68	67.3
≥ mean (Good)	33	32.0
Parents Income		
< mean (Less)	65	64. 4
≥ mean(Height)	36	35.4

The univariate description of the research variables explains the general description of the research data for each research variable including exclusive breastfeeding, parenting style, basic sanitation and parental income. Table 1 shows toddlers with poor parenting patterns of 27.7% (28 subjects) and bad parenting patterns of 72.3% (73 subjects), most toddlers are given exclusive breastfeeding of 26.7% (27 subjects) are in households with poor sanitation good 67.3% (68 subjects), and less family economic income of 64.4% (65 subjects).

Table 2. Frequency distribution of research subjects

Variable Group	Wasting				P
	No		Yes		
	n	%	n	%	
Exclusive breastfeeding					
Not Exclusive	22	81.5	31	18.5	<0.001
Exclusive	43	58.1	5	41.9	
Parenting					
Not enough	2	11.8	50	59.5	<0.001
Good	34	40.5	15	88.2	
Basic sanitation					
Not enough	8	21.6	36	78.4	<0.001
Good	28	43.8	29	56.3	
Income					
Not enough	16	57.1	53	72.6	<0.001
Tall	20	27.4	12	42.9	

There is an effect of exclusive breastfeeding with the incidence of wasting in children under five years. Children who are exclusively breastfed are statistically significant to the risk of wasting (p <0.001). There is an effect of maternal parenting on wasting *in* children under five years. Good maternal parenting is statistically significant as a protective factor against the risk of wasting with (p <0.001). There is an effect of maternal parenting on wasting *in* children under five years. Good maternal parenting is statistically significant as a protective factor against the risk of wasting with (p <0.001). There is an effect of basic sanitation on wasting in children under five years. Households with good basic sanitation are statistically significant protective factors against the risk of wasting with (p= <0.001). There is an influence of income with wasting *events*. A good family economic income is statistically significant as a protective factor against the risk of wasting (p= <0.001).

Table 3. Multivariable Analysis

Variable	B	P Wald	Sig	OR	95% CI
Brest milk	1,362	4,258	039	3,906	1071-14247
Parenting	1926	7,478	006	6,863	1726-27290
sanitation	1,490	4,882	.027	4,435	.744-10.272
Income	1.017	2,303	.129	2,764	1183-16624

From the multivariable analysis related to wasting are breastfeeding, parenting, sanitation and income. Parenting is related to wasting with OR 6.863 means the respondent has poor parenting has 6 times higher chance of suffering from wasting. Parenting style is the dominant factor because it has more OR big.

Sanitation is related to wasting with OR 4.435 means that respondents who have poor sanitation have a 4 times higher chance of suffering from wasting than good sanitation after controlling for parenting, breastfeeding and income variables.

Brest milk is associated with wasting with OR 3.906 means that respondents who were not given exclusive breastfeeding had 3 times higher chance of suffering from wasting than those who were given exclusive breastfeeding after being controlled by the parenting, sanitation and income variables.

Income related to wasting with OR 2.764 means that respondents who have less income will have 2 times higher chances than respondents who have high incomes after controlling for the variables of parenting, sanitation and breastfeeding.

DISCUSSION

This study shows that there are four variables that have a direct influence on the incidence of wasting in children under five years including exclusive breastfeeding, parenting style, basic sanitation and parents' income.

1. **Prevalence of wasting in Kupang district**

Wasting is an indication of a nutritional problem where the condition of a child whose weight decreases over time until the total body weight is far below the standard growth curve or weight based on height is low (thin) and shows severe (acute) weight loss as the usual trigger because children get diarrhea so their weight drops dramatically but their height is not a problem (Kemenkes RI, 2022).

The frequency of acute and chronic malnutrition in East Nusa Tenggara ranks highest in Indonesia with the prevalence of wasting still above the national average. The prevalence of wasting in NTT will increase from 7.5% in 2020 to 8.0% in 2021. Kupang Regency is one of the districts in NTT that experienced the highest increase in the percentage of wasting under five, namely 11 % and in absolute terms under five with wasting nutrition problems 42 under five in Year 2021 (Kemenkes RI, 2020).

This study is similar to that conducted by Beal et al., (2018) that high nutritional problems are influenced by various interacting factors such as poverty, education, food availability at the household level, which will have an impact on low family income.

2. **The effect of exclusive breastfeeding on the incidence of wasting in children under five years**

Breast milk is the best food for babies, because it contains various nutrients that babies really need according to (Fox et al., 2015). Exclusive breastfeeding for the first six months can produce optimal height growth, and stopping breastfeeding early is clearly as detrimental as breastfeeding without providing adequate additional food. Breastfeeding as early as possible immediately after birth is an early stimulation of child growth and

development (Soetjiningsih, 2012).

This research is in line with the research of Vionica et al., (2019) which showed that babies who experienced malnutrition were more likely to be babies who were not given exclusive breastfeeding. Likewise, other studies have proven that there is a significant relationship between history of breastfeeding and wasting by obtaining OR = 3.223. This means that respondents who have toddlers who are not exclusively breastfed tend to experience wasting 3.223 times greater than respondents who have toddlers who get exclusively breastfed (Afriyani et al., 2016).

The results of this study stated that there was a relationship between breastfeeding and wasting. This is in line with the results of research which states that children who have a history of non-exclusive breastfeeding will affect their nutritional status in the future (Louis et al., 2022). Working mothers are relatively less able to breastfeed significantly, and this will have an impact on the growth and development of children under five (Saraha, 2020).

Exclusive breastfeeding is proven to reduce the risk of fever, diarrhea and acute respiratory syndrome. Therefore, exclusive breastfeeding is able to provide protection for babies to avoid several infectious diseases and can meet the intake of essential nutrients needed by babies. The results of this study are in line with WHO recommendations that exclusive breastfeeding should be given to infants up to 6 months of age and continued until 2 years.

Other studies have shown that exclusive breastfeeding can prevent the occurrence of several diseases such as diarrhea (42%), acute respiratory disorders (27%), and fever (21%). In addition, exclusive breastfeeding can also prevent nutritional disorders in infants, namely being able to prevent wasting (26%) and underweight (23%) in infants under 6 months of age. 20 The results of this study also show that breastfeeding is stopped at the age of (0-3) months) will increase the risk of wasting 2.32 times when compared to babies who are exclusively breastfed (AOR = 2.32, 95% CI: 1.45-3.74).

3. The effect of basic sanitation on the incidence of wasting in children under five years

Sanitation is closely related to the degree of human health, poor sanitation will increase the risk of disease transmission originating from the environment. To improve the quality of healthy life, at least every house must have access to basic sanitation. Basic sanitation is a household sanitation facility that includes defecation facilities, waste water management facilities and household waste management line with the study (Torlesse et al., 2016).

The condition of poor sanitation allows the occurrence of nutrient deficiencies. A person who is malnourished is susceptible to disease and stunted growth. An environment that is not conducive can cause microorganisms that can attack children under five because toddlers are susceptible to disease so they will often get sick, for example diarrhea, worms, typhus, hepatitis, dengue fever and so on. If children under five are often sick, their growth and development will be disrupted.

Based on research by Maulani et al., (2023) states that there is a relationship between sanitation and wasting (p-value = 0.005), poor sanitation has a risk of 3.169 times greater for infants at risk of experiencing wasting, compared to toddlers whose basic sanitation is good. Environmental cleanliness is closely related to the availability of clean water, the availability of latrines, the type of floor in the house, and the cleanliness of cutlery in each family. When clean water is available for daily needs, children are at risk of malnutrition. Environmental cleanliness can be seen from the clean quality of life through clean water, sanitation, toilets and circulation of smoke-free and indoor air. Poor environmental hygiene makes children under 5 years more susceptible to infectious diseases which in turn can affect children's nutrition (Maulani et al., 2023).

Based on the results of research Anggraeni (2018) a p value was obtained of 0.005 ($p < 0.05$); OR = 9.94; CI = 95% (1.97-50.7). This shows that there is a significant relationship between environmental sanitation and wasting. This is because the source of clean water that is used by the community is generally not obtained from the regional drinking water company (PDAM) but from artesian wells where some subjects feel that the source of water used is sometimes a little cloudy and tasteless. The subject's environmental conditions are still classified as bad or do not meet health requirements, namely the problem of waste management, garbage, latrines, and housing.

The results of this study state that there is a relationship between sanitation and wasting. The availability of sufficient and qualified clean water, healthy latrines, sewerage and ventilation also affects the health of the family living in the house.

Basic sanitation also indirectly affect the incidence of stunting through maternal hygiene practices and diarrheal diseases. This study is also relevant to the study of Atok et al., (2022) in North Sudan, said the risk of stunting is higher among children living in the household sanitation worse.

Research by Hasanah et al., (2022) states that there is an influence between sanitation and wasting with a p-value = 0.042. Toddlers with poor sanitary hygiene are at risk of 2.76 times experiencing wasting compared to toddlers with very good sanitation hygiene. On the

other hand, families who do not regularly clean containers to transport household consumption water are twice as likely to have wasting toddlers (Marshak et al., 2017). Access to water sources to households has been shown to be a factor associated with acute malnutrition (van Cooten et al., 2019).

Hygiene and environmental sanitation have a fairly dominant role in providing an environment that supports the health of toddlers and their growth and development. Personal and environmental hygiene plays an important role in the emergence of diseases that will affect nutritional status (Abeng et al., 2014).

4. The influence of mother's upbringing on the incidence of wasting in children under five years

Mother's parenting pattern is the behavior of mothers in caring for their toddlers. The practice of feeding children is very important and great for children's growth such as providing a comfortable atmosphere for children when eating, being patient and attentive when giving food, knowing good eating habits in children can establish familiarity between the two so that it is hoped that children are able to finish food given (Yudianti & Saeni, 2016). Breastfeeding and feeding in a healthy and nutritious way and controlling the portion size consumed will improve the nutritional status of children (Yudianti & Saeni, 2016).

Based on research by Noflidaputri et al., (2022) states that there is a significant relationship between parenting styles and wasting incidents in the working area of the Muara Labuh Health Center, South Solok Regency in 2022 with a p-value = 0.002. Mothers who have poor parenting patterns are 11 times more likely to experience wasting in toddlers compared to mothers who have good parenting styles for toddlers.

The results showed that there was an influence between mother's upbringing and wasting. Parenting patterns for children are manifested in several ways in the form of breastfeeding and complementary foods, psychosocial stimulation, environmental hygiene and sanitation practices, treatment of children in sick conditions in the form of health practices at home and patterns of seeking health services. Habits that exist within the family in the form of feeding practices, hygiene practices, psychosocial stimulation, utilization of health services and environmental sanitation have a significant relationship with the incidence of stunting in children aged 24-59 months (Atok et al., 2022).

5. The effect of income on the incidence of wasting in children under five years

Income is the amount of family income in one month to meet family needs which is measured in rupiah units. This study is the same as that of Hanum (2018) that high nutritional problems are influenced by multiple interacting factors such as poverty,

education, food availability at the household level, which will have an impact on low family income.

The results showed that there was an influence between family income and the incidence of wasting. Low income will not be able to meet the needs of balanced nutrition, moreover parents with low income will not be able to meet the nutritional needs that toddlers must have in the form of balanced nutrition. Families with low incomes will This is in line with research in Tamil Nadu showing that families with low economic status experience prevalence and the difference was found to be statistically significant (Anuradha et al., 2014).

This is in line with a study in Tamil Nadu showing that children from families with lower economic status experienced prevalence and the difference was found to be statistically significant ($p<0.05$) (Anuradha et al., 2014). Research conducted by Meshram (2018) found that the prevalence of wasting was 2.56 times higher with low per capita income than children with high per capita income (Meshram et al., 2019).

CONCLUSION

The conclusions based on the conclusions above are as follows :

1. There is a relationship between wasting in children Under the Age of 5 in Kupang Regency
2. Breastfeeding, parenting, sanitation and income are related to wasting Parenting towards wasting is the dominant variable with the highest OR value of 6,863 which means that the respondent's parenting style poor parenting has 6 times higher chance of suffering from wasting than good parenting after controlling for the breat milk, sanitation and income variables.

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